Case Report

Self-replantation of an avulsed tooth in torsoversion: a 10-year follow-up

Rai P, Gupta U, Kalra N. Self-replantation of an avulsed tooth in torsoversion: a 10-year follow-up.

Abstract – A 15-year-old moderately built boy reported to the dental outpatient department with a complaint of pus discharge from the upper front teeth. There was a clear history of traumatic avulsion followed by self-replantation 6 years earlier. No dental treatment was taken by the child. On clinical examination the left upper central incisor was in torsoversion (anatomical labial surface on palatal side and vice versa). The child had probably self-replanted in torsoversion. Endodontic treatment was successfully completed, and final rehabilitation was done by a porcelain crown. The case highlights the excellent results of immediate replantation even when it is done by a child. It also highlights the value of school level dental education.

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Survival of a replanted tooth depends on replantation within the first 5 min (1–4). This is the only condition where root surface fibroblasts and precursor cells from the root and alveolar periodontal ligament can live, reproduce and become functional fibroblasts capable of producing a united periodontal ligament to protect the root from resorption. The guidelines for treatment of avulsed teeth have progressively changed as more research has been reported. However, for many years the recommendation of immediate replantation as the ideal emergency procedure has not changed. The following case report outlines the history of an avulsed tooth that was replanted immediately by the patient in torsoversion; no professional help was sought. After 6 years the tooth became symptomatic. This tooth was endodontically treated and further rehabilitated.

Case report

A 15-year-old boy reported to the dental OPD with dull ache and pus discharge from the vestibule area of the upper anterior teeth. The patient had undergone two courses of antibiotic therapy in the past month as advised by his general practitioner. The complaint was diagnosed as a chronic periapical lesion in relation to the left upper central and lateral incisors and a draining sinus tract associated with the pulpless teeth. The right upper central incisor was also fractured, Ellis class II. The left upper central and lateral incisors were grade 1 mobile. There were vertical enamel fractures in the right upper central incisor and the left upper central and lateral incisors (Fig. 1). Further clinical examination revealed that the left upper central incisor was in torsoversion, i.e. the palatal side in labial position (Fig. 2). The radiograph showed the periapical lytic area of bone in relation to the left upper incisors measuring 8 mm × 5 mm and root resorption (Fig. 3). The left upper incisors did not respond to vitality testing but the right upper central incisor was vital and symptomless.

The patient reported having had a fall when he was 9 years old. The left upper central incisor had been completely avulsed onto the floor, and he had immediately picked it up and replanted it in its socket. He did not tell his mother out of fear. After 1 week the mother found his front teeth very dirty; it is then that he confided in her that he had had a fall

Fig. 1. The facial photograph shows traumatized teeth.

Fig. 3. The pretreatment radiograph shows a large periradicular pathology in relation to the left upper central and lateral incisors.

Fig. 2. The left upper central incisor was self-replanted in torsoversion, i.e. the anatomic palatal surface on the labial side. The adjacent incisors were also traumatized.

Fig. 4. The fourth month postoperative radiograph shows the teeth treated by endodontics and periradicular curettage. The bone repair was taking place and there was no further root resorption.

and had put back his tooth in a hurry the wrong side up. By this time the tooth was firm and asymptomatic. The tooth was then forgotten. After 6 years the patient reported dull ache and pus discharge from that area. This is when he reported to the dental OPD. Basic haematological investigations were performed and a pus smear was evaluated. It showed chronic inflammatory cells. Endodontic treatment was commenced under local anaesthesia and rubberdam. The root canal was instrumented, debrided, biomechanical preparation was done and calcium hydroxide was placed for 6 weeks. The patient returned and reported that pain was present on biting. A periradicular surgery was now planned for the patient. A mucoperiosteal flap was lifted, apical curettage was done and the teeth were obturated.

When the patient returned 4 months later, pus discharge had ceased, there was no pain on percussion and no mobility in the teeth. A periapical radiograph showed that bone repair was well advanced and there was no further root resorption (Fig. 4). Final rehabilitation of the patient was carried

Fig. 5. The photograph shows the left upper central incisor with an intermediate crown.

Fig. 6. Final rehabilitation of the patient was done by fabricating a porcelain crown and composite restorations.

out by fabricating a porcelain crown for the left upper central incisor and composite restorations for the right upper central and left upper lateral incisors (Figs 5 and 6). The patient was reviewed 6 months later. Examination showed no signs of disease (Fig. 7). Four years later the patient came back with a fractured composite restoration in the left upper lateral incisor; it was redone and a periapical radiograph confirmed that the lytic area had healed completely with no further root resorption (Fig. 8).

Fig. 7. The post-treatment facial photograph of the patient shows an esthetic smile.

Fig. 8. The 4-year follow-up radiograph of the patient shows a completely healed periradicular area with no further root resorption.

Discussion

American Association of Endodontists 1983 Guidelines (5) for treatment of avulsed tooth have stressed the importance of immediate replantation whenever possible, preferably within 5 min. The duration of survival is affected by both the age of the patient and the removal of necrotic pulp. Preadolescents and adolescents are statistically more apt to experience dental injuries such as avulsion. Root maturity and the adolescent growth spurt both complicate replantation outcomes (6). An immature root will have less bulk to resist root resorption and can present obturation difficulties because of its immature apex. In addition, the inevitable ankylosis and root resorption will lead to infraocclusion as facial growth occurs. Ischaemic pulp tissue can become

necrotic and stimulate inflammatory resorption (1, 7). Inflammatory resorption can be treated with calcium hydroxide, but it can be prevented by early removal of the pulp and obturation first with calcium hydroxide followed by conventional gutta percha/sealer endodontic treatment (7). Immediate replantation is again stressed; storage medium becomes irrelevant because within the first 15 min the cells' ability to develop into functional fibroblasts and cover the root surface is lost (4). In addition, periodontal ligament necrosis is so extensive after 30 min of storage in any medium that adequate regeneration will not occur and healing will proceed by repair (replacement resorption and ankylosis). Current guidelines recommend the use of a flexible splint such as nylon fishing line, fibre glass strands or braided wire attached with composite resin to the teeth (8). Because of its flexibility, this splint allows physiological 'jiggling' movements of the tooth, which result in less ankylosis. A normal diet should also be recommended as masticatory stimulation has a positive effect in reducing the extent of ankylosis. The case reported above was not splinted and the patient did not take any special dietary precautions following the self-replantation. Such actions support these recommendations to help reduce ankylosis.

Pulpal reactions to traumatic injuries can vary greatly. In the current case report it appears that the pulp may have undergone necrosis at an early stage, following avulsion. Subsequently, a periapical radiolucent lesion developed as a result of an infected canal. While the periapical inflammatory process was present, it appeared that there was also some apical inflammatory resorption of the root; this was evident radiographically by the irregular appearance of the root surface at the apex and clinically by the lack of apical constriction. The presence of periapical lesion and inflammatory resorption led to the use of calcium hydroxide for 6 weeks. Calcium hydroxide has been shown to be effective in the treatment of inflammatory root resorption and in the stimulation of hard tissue repair, particularly at the apex of a tooth (9). Periradicular curettage was performed as symptoms persisted and the pathology was large in size, not expected to resolve through the root canal treatment.

Conclusion

The viability of periodontal ligament cells left on the root of an avulsed tooth is the most important factor determining the prognosis of a replanted tooth. Whenever possible, immediate replantation is the ideal emergency procedure at the accident scene. A sensitized person can replant a tooth simply by pushing it back into the socket. Dentists are rarely present at the scene of injury, and caregivers including trainers and coaches do not want to replant a tooth into a bleeding mouth. Consequently, immediate replantation is a rare event (since the patient himself is so distraught and disoriented with the injury). This case report demonstrates that such early replantation followed by normal masticatory function can help to improve prognosis. This tooth had been maintained in normal functional state for 6 years inspite of being in torsoversion, and with endodontic treatment and rehabilitation it is expected to have a good prognosis. The above report once again highlights the unique healing and regenerative capacity of oral tissues. It also proves the need for dental education at an early age so that immediate replantations become more common.

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